The Excavating Engineer

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Land Reclamation by Hydraulic Dredging in Japan

Work Under Way in Tokyo Bay with an American 20-inch Dredge

THE problem which has a subtle influence over all other problems in Japan today is that of expansion. It is one of the greatest underlying influences behind Japan's foreign policy, and it is one of the most vital domestic questions before that dynamic young nation.

This fact brings out in a more interesting light the land reclamation work now under way in Tokyo Bay near Yokohama.

It is a fact not generally known that hardly 12% of the area of Japan is flat; the remainder is mountainous and not available for housing or cultivation. Consequently, every square inch of the entire empire is very intensively worked, one way or another. For this reason during the past few years the Japanese have been adding patches onto their island at every available point. This has generally been done by means of hydraulic dredges.

The photograph which we reproduce herewith illustrates the latest and largest of these installations. The dredge, a 20-inch machine, operated by electricity, is owned by the Tokyo Bay Reclamation Company, a subsidiary of the well-known Asano interests which operate such companies as The Asano Cement Company, The Toyo Kisen Kaisha, one of Japan's large steamship companies, The Asano Dry Dock Company, The Asano Ship Building Company and many others. Indeed, Mr. S. Asano, its founder and president, is generally considered as the Charles M. Schwab of Japan.

Description of Hydraulic Dredge

This dredge, as stated, is the largest in size and capacity in Japan. It is designed to pump through 3000 feet of pipe line at an elevation of 10 feet. It will dig to a depth of 35 feet, being equipped with a 50-foot ladder. The pump is of extra heavy construction, having an unlined casing of nickel chrome steel. The cutter head is six bladed, also of special annealed nickel chrome steel. The 20-inch inboard suction and discharge pipes are one-inch thick, being especially heavy to withstand wear. The outboard discharge pipe line is of the swivel elbow type.

The dredge is driven by a main motor of 1000 H.P. at 375 R.P.M. The cutter motor is 150 H.P. and the winch motor 50 H.P.

The machinery was built and designed by the Bucyrus Company, the dredge was assembled and launched at the yards of The Asano Ship Building Company at Tsurumi, Japan, which company constructed the hull to Bucyrus designs, the hull measuring 120 feet by 35 feet with a depth of 8 feet.

Dredge Operation

The dredge was put to work early in 1922, immediately after the launching, having been erected complete on the ways. Contrary to previous experiences there was practically no loss of time due to necessary adjustments. As the usual practice appears to have been to expect normally from one to six months for such adjustment, this performance was particularly pleasing to the engineers in charge.

The dredge was put to work in Tokyo Bay near Yokohama, not far from where it was launched and where it is still in operation at the time this article goes to press. It is used for making land for manufacturing and housing sites.

Even at the start of operation the dredge showed tremendous possibilities. When our photographs were taken it was pumping sand, silt and clay through a 3700-foot pipe line at an elevation of somewhat over five feet, and was averaging over 400 cubic yards of solids per hour, which was considered as an exceptional record considering the newness of the dredge.

A point of unusual interest in regard to this installation is the fact that the dredge was entirely erected and put into operation by Japanese engineers without foreign assistance, which not only speaks well for the Japanese efforts but for the workmanship of the manufacturers.

Breaking Ground for the British Empire Exposition

How the Work of an American Dragline Excavator Impressed the Press of the British Isles

GROUND was broken on March 29th of this year for the great British Empire Exposition, which will be opened in 1923 for the purpose of exhibiting the products of the industries of Great Britain and its colonies.

The site of this exposition is at Wembley Park, a suburb of London. In order to give the exhibition a proper send-off at its inception, elaborate plans were laid by Sir Phillip Lloyd-Greame, Parliamentary Secretary of the Department of Overseas Trade. On the day appointed, therefore, a special train took a large and distinguished company to Wembley Park. This party included the high commissioners of the Dominions, agents-general, Members of Parliament, and members of the executive council of the British Empire Exposition, together with representatives of the government departments, the railway companies, business concerns, and the press of the British Isles. The next day fifteen of the foremost newspapers throughout Great Britain gave considerable space to the event.

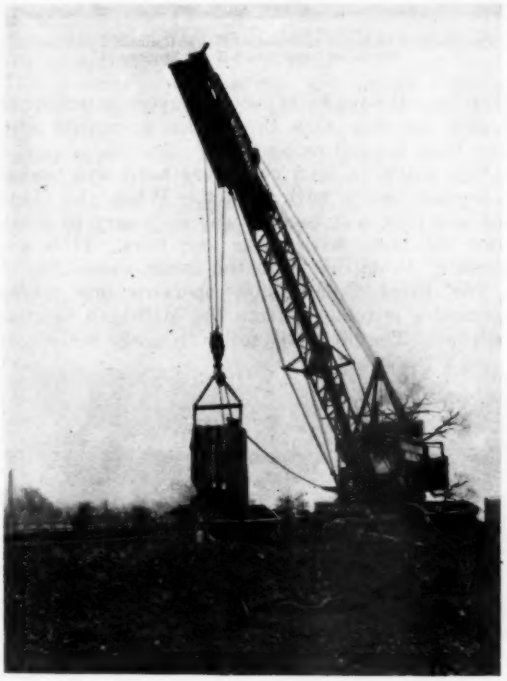
The following is an extract from the Financier of London:

"The occasion was the first official inspection of the ground already cleared, and more particularly of the huge and powerful Bucyrus steam excavator, a machine which in itself is a striking testimony to the capabilities of British engineers for undertaking any tasks of any magnitude, and to design and construct suitable tools and appliances for the most difficult civil engineering work. * * * The most spectacular part of the work is being carried out on the hill, where a new type of steam excavator is at work removing tree trunks and cutting away solid clay banks at an astonishing speed. The power and size of this machine may be imagined when it is mentioned that it will not only cut and lift some 2½ tons of clay in a few seconds but it can pick out of the

Breaking Ground for the British Empire Exposition at Wembley Park, Near London

ground a couple of tree stumps at a time as quickly as the men on the ground can fix the chains in place and couple them up to the crab.

"In addition to this gigantic machine, which at a distance resembles one of Mr. H. G. Wells' Martians, and which close at hand appears to have almost their intelligence as it picks its way over rough and clayey ground on its big caterpillar wheels, are a number of lesser cranes and machines, and altogether the afternoon's visit demonstrated in a striking manner not only the vastness of the undertaking but the determination of all concerned to make the exhibition one of the most, if not the most, successful of such undertakings since the great World's Fair at Chicago."



A Class-14 Bucyrus Loading "Tip Wagons"

Here is what the Daily Chronicle, another well-known London paper said:

"One of the biggest steam excavators in the world, which can remove four tons of earth at each swoop, is operating on the site of the British Empire Exposition at Wembley Park.

"It weighs a trifle over 80 tons, and looks like a primitive steam engine and a huge crane perched on top of a flattened tank.

"A gathering of high commissioners, agents-general and Members of Parliament yesterday watched the 'steam navvy' at work.

"Sir Robert McAlpine, whose firm designed the engine, and Sir Phillip Lloyd-Greame, Parliamentary Secretary of the Department of Overseas Trade, stood on the 'quarter-deck' to direct the operations.

Another View of the Dragline Clearing the Ground

"To employ the excavator to the best advantage requires almost as much skill as salmon fishing. A great steel bucket fitted with four enormous teeth and suspended from a 60-foot boom, is sent hurtling through the air.

"If the 'cast' is successful, the bucket catches in the ground, and removes anything that comes in the way, from a tree stump to a section of a railway embankment."

As may be gathered from the foregoing, the work of clearing the site for the exposition is in the hands of the well-known engineers and contractors, Sir Robert McAlpine & Son of London, and, furthermore, that the chief attraction was the "Giant Navvy," a Class-14 Bucyrus dragline excavator, equipped with a 60-foot boom and a 2½-cubic-yard bucket. We publish herewith views of this machine taken on this occasion.

A Steam Shovel Man's Philosophy

(It need not be added that he is Irish)

"Some ——— ——— salesman got me drunk and sold me this steam shovel about twelve years ago. Since that time it has made money for me every day. So I never miss a chance to get drunk."

A motorist came upon another whose machine had broken down on the road. In the disabled car sat a woman.

"Need any assistance?" inquired the newcomer, courteously.

The other man lifted his flushed and grimy face from under the hood. "Yes," he replied, "I wish you'd answer my wife's questions while I'm fixing this infernal engine."

County Gravel Pit Operation in Ontario

How a Revolving Shovel Has Replaced Clamshell Excavators in the Essex County Pit

THE Essex County Road Commission is at the present time operating a gravel pit two miles north and two miles west of Leamington, Ontario. This pit was purchased by Essex County from the Michigan Central Railroad, by whom it was operated for the past twenty years with standard railroad-type shovels, with an average capacity of about 20 cars per day.

The property consists of 35 acres, and the County Road Commission recently purchased 35 acres more, making a total of 70 acres. The gravel is of excellent quality, being shipped pit run without screening, principally for road work in that county.

The Shovel is Mounted on Standard Gauge Railroad Trucks and Works on 7-foot 4-inch Track Sections

Digging the First Cut

The county originally used a small clamshell machine in this pit, but it was found unsatisfactory and was sold. They then put in a 1¾-yard clamshell machine which was kept in service for about a year. This was disposed of in May of this year in favor of a 30-B Bucyrus revolving shovel mounted on standard gauge railroad trucks and equipped with a 1-yard dipper, which is giving them excellent satisfaction.

The pit is located on the side of a rather steep hill. The first work which the shovel did was to make a box cut 5 feet to 6 feet wide. Up to the time this article goes to press the 30-B has, for a considerable portion of the time, been loading cars on a bank, the lift measuring 10 feet from the shovel rail to the top of the car.

Michigan Central composite cars are being used, 26 inches deep, with a heaped capacity of 48 cubic yards. In the box cut one of these cars was loaded in twenty minutes. The operator had never been on this type machine before, but in spite of this obvious handicap has been loading from 18 to 20 cars a day. Mr. Giddis, the pit superintendent, advises us that considerable delay was caused by switching coal to the shovel when in the 10-foot lift. When the loading track is taken into the pit he expects an average output of 25 cars per day with three trips a minute with more than a yard to load.

The gravel is, as a rule, very hard and cannot be broken easily with a pick. When the clamshell machine was used it was necessary to break down the bank with picks and bars. It is not necessary to do this with the steam shovel.

The Road Commission operates one 50-ton locomotive purchased from the Michigan Central Railroad. The pit is 3½ miles from the main line,

30-B Bucyrus Loading Cars with a 10-foot Lift

connected therewith by a spur track. The storage yard has a capacity for about 50 cars. The shovel is operating on track sections 7 feet 4 inches long.

Although it is estimated that 1500 cars of gravel will be used on county roads this year, the pit is supplying, in addition, a growing demand for concrete gravel from contractors outside the county, in fact the pit is at present at work on a 10,000-yard contract for one contractor.

W. H. Knister is superintendent of county roads for Essex County and in general supervision of the operations. The pit superintendent is Charles Giddis of Kingsville, Ontario.

Comparison of Hand Labor and Revolving Shovel Costs on an 80,000-yard Job in England

Methods employed in connection with the construction of a large factory at Greenford, Middlesex, England. Description and cost of revolving shovel operation in comparison with hand labor.

IT is a very well-established fact in the United States that the revolving shovel, properly used, is a far more economical method of handling earth excavation than by doing the same work by hand. However, because of the higher wage scale existing in this country and because of other conditions involved, the application of the small steam shovel, or "navvy" as our English cousins call it, has not been nearly as general in other countries as it has in the United States.

With this fact in mind the work completed last year by the well-known firm of J. Lyons & Company, Limited, at Greenford, Middlesex, England, is of more than ordinary interest.

This firm is perhaps the best known catering company in England. In addition to operating a large number of small restaurants in London, very similar to our familiar "Childs Restaurants" this progressive concern controls several of the largest hotels in London in addition to a number of the higher type of restaurants. Because of the rapid

Railway Siding of Factory, Excavated by 14-B

growth of their business, Messrs. J. Lyons & Company, Ltd., have purchased about 40 acres of land at Greenford, a suburb of London, and have erected thereon extensive factories for the handling of the tea, chocolate and other commodities for which they have become justly famous, giving employment to about 5000 people. This site is close to London and will be served by road, railways and canals.

The Problem Involved

The scheme is a most interesting one, and indicative of the progressive spirit of British industry. The whole plant is self-contained, having its own water supply and sewerage systems, its own docks and terminals. Extensive sidings have been installed for handling 40 railroad cars daily, and a dock has been constructed capable of unloading five barges at one time, to take care of canal transportation.

The 14-B in Operation—Spotting the "Wagon" Under the Dipper

In addition to the factories, large, airy mess halls have been provided as well as an athletic field for the employees, the whole being as complete an equipment as can be found in Great Britain.

The entire work of construction, including the excavation, was done by Messrs. J. Lyons' Construction Department. The principal problem encountered by the engineers at the start was the lay of the land, which had a fall of about 30 feet. The levelling of this ground was the first task. This necessitated the excavation, the transportation and the spreading of the material to form a suitable site for the new buildings.

Equipment Used

For this purpose a 14-B Bucyrus revolving shovel was purchased. This shovel was mounted on caterpillars and equipped with a 2/3-yard dipper. The area of the ground to be levelled was about ten acres, calling for the excavation of approximately 80,000 cubic yards of material, including the excavation of basements for the buildings, averaging twelve feet in depth.

Shovel Operation

The shovel loaded 1¼-yard V-shaped cars, which, during the greater part of the work, were hauled by a Bagnal locomotive in trains of 4 to 5 cars.

No trouble whatsoever was experienced with the shovel from beginning to end, notwithstanding the fact that a great deal of water was encountered at the early stages of the excavation.

Careful records were kept throughout of the shovel operation and the cost thereof. These costs we have been informed would have been much lower if it had been possible to have used the machine to anything near its full capacity. This,

however, was impossible due to the fact that the excavated material had to be conveyed long distances and carefully levelled at the dump, in order to form sites for future expansion. Furthermore, the car service was not sufficient to keep the shovel busy.

Cost and Output

The shovel was worked in eight-hour shifts for the greater part of the time, the average output per shift after deducting 20 per cent swell of material was approximately 260 cubic yards. The cost, including laying and shifting of track, transporting material, dumping and levelling, averaged 1/9¾d per cubic yard or about 43 cents.

The best day's output was 360 1¼-yard cars containing an average of 1½ cubic yards or 540 cubic yards in 6½ hours.

Hand Labor — A Comparison

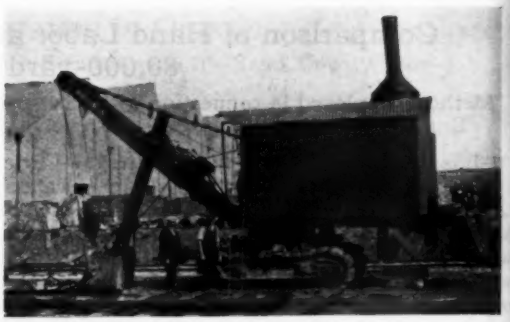
Before the steam shovel was put to work on the above-described project, the Construction Department started work on the excavation for a large dock on the canal which runs along one side of the Company's property. This work was done by hand labor and offers a very striking comparison with the steam shovel cost. The work involved the excavation of 5000 cubic yards of material. The first three feet of this was done at a cost of 4/ (96c) per cubic yard, and the last three feet 5/6d ($1.32) per cubic yard.

It may be seen from this that the cost of excavating the 5000 yards by hand labor was approximately $5700. This same amount of material

Canteen for Employees, One of the 1¼-yard "Wagons" May Be Seen in the Foreground

could have been dug, hauled and spread by the steam shovel for about $2150, if we apply the cost per cubic yard of the above-described work.

We give below the cost of steam shovel operation, taken from the Company's books for January 1920. This has been figured for our American readers in dollars and cents at par exchange ($4.86=£1-0-0) as well as in pounds and shillings.



The 14-B Bucyrus After Completing Its Task

Per Day—Eight Hours

	£	s.	d.	
Driver	1	2	6	$5.40
Foreman		10	0	2.40
Coal (15 cwt. 1680 lbs. per day)	1	15	0	8.40
Water (@ 2/6 per 1000 gals.)		12	6	3.00
Proportion — washing out machine (once in two weeks)		2	0	.48
Engineers' attendance, including part night watchman's wages		5	0	1.20
Cylinder and engine oil and paraffin, stuffer grease and waste		2	6	.60
	4	9	6	$21.48

Bagnal Locomotive

Driver (including proportion washing out)	1	0	0	$ 4.80
Brakeman		13	4	3.20
Fuel		6	8	1.60
Oil, etc.		1	0	.24
	2	1	0	$ 9.84

Men Around Machine and on Tipping Bank

	£	s.	d.	
2 Gangers (foremen), 8 hours each @ 1/9½d. per hour	1	8	8	$ 6.88
15 Navvies (laborers), 8 hrs. each @ 1/8 per hour	10	0	0	48.00
5 Plate layers, 8 hours each @ 1/9 per hour	2	16	0	13.44
Foreman (part time)		8	0	1.92
	14	12	8	$70.24
Supervision and overhead charges	2	10	0	12.00
	23	13	2	$113.56

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Puddin' Head

For twenty years two chess players met daily at Brown's Chop House, took their places silently, silently played their game and silently departed. For twenty years a third party sat by and silently looked on.

Then one of the two players failed to show up—for the first time in twenty years. After waiting a few minutes, his partner said to the onlooker, "I guess he isn't coming today. Will you play his men?"

"Sorry," was the answer, "but I don't know the game."

He had followed every move for twenty years but he didn't know the game. He had watched the drama of king and castle for two decades without sensing a single undercurrent of strategy, speculating on a single motive, or anticipating a single coup.

He had displayed infinite patience in looking at the game, but he couldn't be bothered looking into it. He showed every symptom of life except its first symptom—curiosity.

He belonged to that listless army of passive observers who clutter up the side lines of business—men who look without seeing, listen without hearing, do without understanding.

Placed in an office—at a bench—he would remain twenty years ignorant of his neghbor's job, his superior's problems, his own significance. When the opportunity for advancement came, he would have to say, "Sorry, but I don't know the game." —*Entertainment News.*

Care and Maintenance of Excavating Machinery

In this issue of The Excavating Engineer, under our Field Note Department, we are publishing the first of a series of articles on the above subject.

These articles have been prepared by experts, and although intended primarily to serve as instruction and guidance for new operators they will undoubtedly be of value to those more experienced.

We cordially invite correspondence and discussion of the points brought up.

· FIELD NOTES ·

Instructions on Care and Maintenance of Excavating Machinery

This is the first of a series of articles which we intend to publish on the care and maintenance of excavating machinery. It is intended primarily for the man on the job, and we would be very pleased indeed to receive any comments, suggestions or criticisms which any experienced shovel or dragline operator might care to make.

I. General Upkeep

There is probably no class of machinery built with greater ruggedness and strength throughout than is excavating machinery. One of the principal reasons for this is the fact that on the general run of excavation work, unless the machine is kept working steadily, material cannot be moved at a low cost. It is the first duty, therefore, of any operator to keep his machine in good repair.

The high-grade, experienced operators have no hard and fast rule for the time of shutting down a machine for repairs except that a machine should not be run if there are repairs needed, which, if not made promptly, are likely to cause further and serious damage. However, if there are minor repairs or changes which will improve the operation of the machine, the operator will endeavor to run until nearly lunch hour or quitting time and then make them. An experienced operator will never shut his machine down when it is really not necessary, but always does shut it down promptly when it needs immediate attention. This is a matter of good judgment which the operator has gained by experience and study. His judgment regarding this matter governs to a great extent the yardage moved.

Certain parts of the machine which are not functioning properly will come or be called to the attention of the operator or person in charge.

Even an experienced man may try several times to correct the trouble without success. Such a man would then advise the superintendent or general foreman and request his opinion as to what should be done. Under no circumstances would he neglect this matter until the condition became such that the machine would have to shut down for general repairs. The action taken by the operator does not show ignorance on his part—rather it indicates to the superintendent or general foreman that he is interested and is willing when difficult points arise to request the co-operation of other members of the organization.

An experienced operator generally makes all the necessary adjustments and repairs to the moving parts, and also at regular intervals inspects the permanent connections of the structural parts and castings. He realizes the importance of keeping the moving parts working properly, also the equally important factor that the various bolts and rivets holding the structural members and castings in position be kept tight. This operator realizes that by keeping these rivets and bolts tight will prevent the members from working, and greatly simplify the work of keeping the moving parts in proper alignment.

The operator makes his inspection at regular intervals—at least once or twice a month on days when the machine is idle; and if any bolts are found loose they are tightened, or if any rivets are loose they are cut out and re-driven. These points are carefully looked after when the machine is assembled to insure well-connected members; and the operator considers keeping these members tight as one of his duties of equal importance to that of seeing that the moving parts function properly or that the machine is lubricated properly.

The appearance of his machine is a matter of pride with the experienced operator. He instructs his crew that the floors and machinery must be kept free from oil or dirt which may drip from the bearings, gears or ropes. This will assist in the prevention of accidents. He also finds that he can make the occasional repairs quicker and better. Other rules enforced by the operator are: Repair work must always be done in the proper way—slipshod methods are more expensive in the end; when the repairs are completed, tools and equipment should be placed in their racks and kept clean and orderly. Furthermore, a system of having a place for tools and then every one in its place means that the crews on the other shifts will know where to find these tools. He also insists that the machine in general, condition of the fire and water, as well as the position of the shovel and condition of pit, be left so as to aid the operators on the night shift.

He finds it advisable to paint that portion of the machine which is exposed to the weather once every year or two to prevent deterioration of the iron or wood. Such painting will improve the appearance of the machine. The first impression a visitor obtains of a neat-appearing machine is that the work is being carried on in a systematic and economical way and that the operator is a high-grade, efficient man.

DEVICES YOU OUGHT TO KNOW ABOUT

A Novel Power Shovel

Extracts from paper delivered at April, 1922, meeting of the American Mathematical Society at Chicago by ROGER SHERMAN HOAR, member of American Mathematical Society and Mathematical Association of America. Formerly Instructor at Coast Artillery School and Ordnance School of Application, U. S. Army.

Heretofore, power-shovels have usually had at least two engines: one on the boom, to move the dipper-handle in and out, and one in the house, for traction, hoisting and swinging, the last named function being frequently performed by still a third engine. This is all right for steam, but in a gasoline-shovel it is not practicable to have an engine on the boom. So some makers have used chains, belts or shafting, running up the boom from the main engine, with the consequent friction losses and liability to breakage. Some have hitched up a dynamo to the main engine, and used an electric motor on the boom, with the consequent current losses. Dipper dredges rely on the hoisting rope to pull the dipper one way, and

Fig. 1. 30-B Bucyrus Gasoline Shovel

the weight of the dipper to pull it the other, with a reduced digging power as a result. Road-graders and coal-loaders abandon the dipper handle altogether, slide the dipper along the boom,

and then raise and lower the boom like a derrick leg.

But the new Bucyrus gasoline-shovel does none of these, and yet obtains a positive powerful thrust on its dipper.

See if you can figure it out from the picture of the shovel (Fig. 1), before you read any further. If not, then read the following explanation:

The lower edge of the dipper handle carries two racks, which engage two pinions hung below the boom. Keyed to the same shaft with these pinions is a drum of larger diameter to which are fastened two ropes: A and B of Fig. 2. Each of these ropes runs to a drum of the hoisting engine, each of which drums can be independently clutched or braked.

Braking B, and hauling in or paying out A, results in raising or lowering the dipper.

Braking A, and hauling in or paying out B, results in retracting or thrusting the dipper.

The two clutches are worked with hand levers, and the two brakes with pedals, so that any fine combination of thrusting and hoisting can easily be obtained.

Let us now consider some of the novel mechanical questions raised:

1. What supplies the force for thrusting the dipper into a bank while digging?

2. Is the hoist on the dipper a one-part or a two-part hoist, and what is its direction?

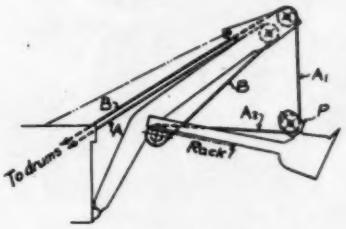


Fig. 2.

Other similar queries will doubtless suggest themselves but quite enough of our attention will be consumed in answering these two.

First as to the thrusting force. Assume that rope A is braked and rope B payed out. When the dipper is not in the bank, the weight of the dipper and contents alone, pulling on rope A_1, revolves the drum and pinions on the boom, and so thrusts the dipper.

See the force diagrams (Figs. 3 and 4). W is the weight of dipper and contents, which we may consider as applied directly under the padlock P (see Fig. 2). If A were attached at P, and the dipper handle were free to slide in and out, we should have the direct result of gravity, represented by the resultant shown in Fig. 3.

But in the mechanism of the new shovel we have four forces acting: W, A_1, A_2 (equal to A_1) and F (the thrusting force, considerably greater than A_1). Fig. 4 illustrates these four forces graphically, the net thrusting force being the heavy shaded part of F.

A comparison of the resultant thrusts, as shown in Figures 3 and 4, illustrates vividly the difference between a pure gravity thrust and the thrust of the new shovel.

So far, we have considered the engine as contributing nothing to this thrust. But now suppose the dipper is digging, with its teeth hooked into a bank. The effect of this is to increase A_1 greatly, and hence to increase A_2, F and W, proportionally. The increase in W is due to the downward thrust of the band on the dipper, as

Fig. 3

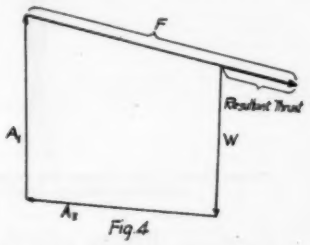


Fig. 4

the dipper is hoisted. All this, of course, proportionally increases the resultant thrust, and at a time when greater thrusting power is needed.

Now, as to the second question. When rope B is braked in pure hoisting, or when the bank resists the thrusting of the dipper in digging, the drum on the boom cannot revolve, and hence rope A_2 cannot move. In other words, the rigidity of the dipper-handle offsets the pull in rope A_2, and we have remaining only the pull of A_1 acting to move the dipper. From a mechanical point of view, it thus becomes immaterial whether the end of A is attached at the boom or at the dipper, or at some intermediate point. As A_1 hoists, the dipper rises as fast as A_1 (not *half* as fast), and so we have a *one-part* hoist, whose pull is along the direction of A_1, rather than (as might appear to be the case) a *two*-part hoist, with a pull bisecting the angle between A_1 and A_2.

An array of similar questions naturally suggest themselves, involving force diagrams, plane motion with two degrees of freedom, positions of equilibrium, bi-circular co-ordinates, etc. In fact, a whole course in mechanics might be written and taught with this shovel as its sole illustration.

A Toss-up

"My heart is with the ocean!" cried the poet rapturously.

"You've gone me one better," said his seasick friend, as he took a firm grip on the rail. —*Tiger.*

Pneumatic Clay Digger Replaces Hand Picks in Trench Digging and Similar Work

Another substitution of mechanical methods for slow and costly manual labor has apparently been made in the case of a new air-operated tool that does the work of ordinary hand picks. With this new tool it now seems probable that laborious hand picking can be dispensed with on many excavation jobs with a considerable saving over former hand methods.

"Little David" Clay Digger (Extension Handle Type) as Used in Trench Digging, Shaft Sinking, Etc.

On many digging jobs in stiff clay and hard soil for trenches, shafts, tunnels, etc., the ground is not hard enough to be drilled and shot, and yet it is too hard to be removed with the ordinary hand shovel alone. Where a large power-driven machine can not be worked the usual procedure is, of course, to employ a gang of men with hand picks to loosen the ground for hand shoveling.

This new air tool has been developed for use by contractors to eliminate most of such hand pick work. Its entry into the contracting field affords a marked labor saving over the old methods so long in use.

In ordinary soil by the pick-and-shovel method one shoveler serves one man with a pick. With one of these pneumatic diggers one man can ordinarily loosen as much ground as five men with hand picks, and the rate will average higher than this in the long run. The man with the air tool maintains a more uniform rate of work with fewer pauses for rest as the work is less fatiguing than swinging a hand pick. One man will loosen enough dirt to keep five shovelers busy all the while — a pronounced saving over the hand pick method.

The danger of accident from careless swinging of the hand pick is also eliminated so that the men are able to work close together in a trench or shaft.

The new compressed air operated tool and its manner of use are shown in the accompanying illustrations. It is a tool of fairly light weight (23 lbs. complete) which a man operates while standing in an upright position. It is, briefly, an air hammer with a cross-bar extension handle, being 34 inches in overall length. A digging blade is held in the nozzle end of the hammer by a suitable retaining device. In operation the blows of the hammer drive the blade into the clay or hard ground so that it is pried loose.

For clay the blades are approximately 6 inches x 8 inches, of a slight scoop shape. For earth they are 5 inches x 9 inches rectangular, with a flat face $\frac{5}{8}$-inch thick at the top and $\frac{1}{16}$-inch thick at the bottom, with the cutting edge beveled from the back.

The throttle is conveniently located in the grip handle, so that the air can be readily shut off as the tool is lifted from one position to another. A buffer inside the retaining nozzle takes the blow if the hammer is operated while the tool is being lifted. An operator, however, soon learns to automatically shut off the air as soon as he starts pulling up on the handle.

The "Little David" at Work in a Trench, Digging Tough Clay

This tool is being manufactured by the Ingersoll-Rand Company, 11 Broadway, New York, and is known as the No. 56H "Little David" Clay Digger (Extension Handle Type). As the name implies this tool is a development from the pneumatic diggers so extensively used in tunneling through clay, the same type hammer being employed in both tools.

The pneumatic clay digger has become a necessary part of the contractor's equipment in driving through clay in sewer tunnel work, and hundreds

of these tools have been employed on such operations to replace hand picking. The cost of tunneling has in many instances been reduced as much as 40 per cent by the use of these machines. It is only natural that contractors having witnessed the possibilities of pneumatic digging in tunnel work, should have extended the use of such tools to operations of a similar nature, i. e., trench digging, shaft sinking, etc. Here also when fitted with an extension handle, the pneumatic digger has been found to be equally as successful as a labor saver and as a means of speeding up the work.

Further information may be obtained by addressing and mailing one of the postal cards enclosed in this magazine to Ingersoll-Rand Co., 11 Broadway, New York.

SHOTS FROM THE · FIRING LINE ·

Chicago and Vicinity

Mr. Reeve Hutchinson of Gillett, Arkansas, was a recent visitor here.

Mr. M. E. Mogg of Indianapolis was also a recent visitor in this city.

Mr. Bill Hays, the well-known Detroit contractor, stopped off on his way West.

Mr. E. J. Scott and Ed. Prenlegast, St. Louis contractors, spent a few days here during the past month.

Mr. Omer Brandon of the firm of Brandon & Hanna, contractors of Detroit, spent a few days in this city tracing some of his equipment through.

Mr. A. G. Reed, president of the A. G. Reed Sand & Gravel Company, Elgin, Illinois, reports very satisfactory shipments of gravel. He is using a Bucyrus Class-14 on this work.

The H. W. Nelson Company have recently added another Bucyrus Class-14 to their operations at Huntington, Indiana.

Mr. R. N. Templeton advises us that he is now working in Canton with the F. R. Jones Company of Cleveland.

Eastern District

BY E. B. WILLIAMS, NEW YORK

The Charles Bennett Company of Brooklyn, New York, are using their Erie B shovel on excavation work on the new cross-town subway job at 42d Street and Fifth Avenue, New York, in conjunction with the contract awarded to the Powers-Kennedy Company. John Rehlly is engineer on the Erie and George Ketchum is firing.

Thomas Schley is operating a 30-B Bucyrus for Fred Schneider on basement excavation work at 125th Street and Broadway, New York City.

John Doremus is operating a Model 21 Marion shovel in the Samuel Braen Rock Quarry near Paterson, New Jersey.

Harry Brooks is operating an Erie Type A shovel in the sand quarry of the Glen Rock Sand Company at Glen Rock, New Jersey.

A. Rivers is operating an Erie B for the G. M. Brewster Company grading some streets near Fort Lee, New Jersey.

Jack Deshler is operating a Thew electric shovel for the Henry Gardner Brick Co. at Little Falls, New Jersey.

William Brown is operating a Keystone excavator for E. C. Humphrey on street grading work at Ridgefield Park, New Jersey.

Raymond Riker is operating an Erie A in the Sowerbutt Stone Quarry on Hamburgh Turnpike near Paterson, New Jersey.

The National Construction Co. of Hartford, Connecticut, is building a concrete road from Norwalk to Westport, Connecticut, a distance of about 2½ miles. A Type O Thew has just finished the excavation. They are paving one side at a time, but owing to the fact that car tracks are in the center of the road one-way traffic is necessary. On account of the heavy Fourth of July traffic, as many as 275 automobiles stood in line waiting their turn to go, it taking thirty minutes for the line to pass. Horace Lewis is superintendent of the job.

Wm. Arthur of Glenbrook, Connecticut, is building a concrete road starting from the station at Darien and running east about two miles. There is about ten thousand yards of excavation, most of which is rock, same being handled by an Erie shovel. Mr. Thomas is foreman of the job.

Charles B. Ryan, formerly a shovel engineer of Mount Vernon, New York, writes us that he has left the ranks of shovel runners and has gone into the contracting business with the firm of Ryan, Ross and Brown. He is operating two Type O Thews and one 14-B Bucyrus, the latter of which he has rented from Duntley-Sheets-Smith Company.

A. Galloway is operating an Erie B shovel for the Consolidated Stone & Sand Company in their quarry near Upper Montclair, New Jersey.

The J. P. White Company of Passaic, New Jersey, have recently started work on a 14-mile sewer contract at Clifton, New Jersey. They are using a Keystone ditcher to excavate the trench which averages 7 feet deep and 2 feet wide.

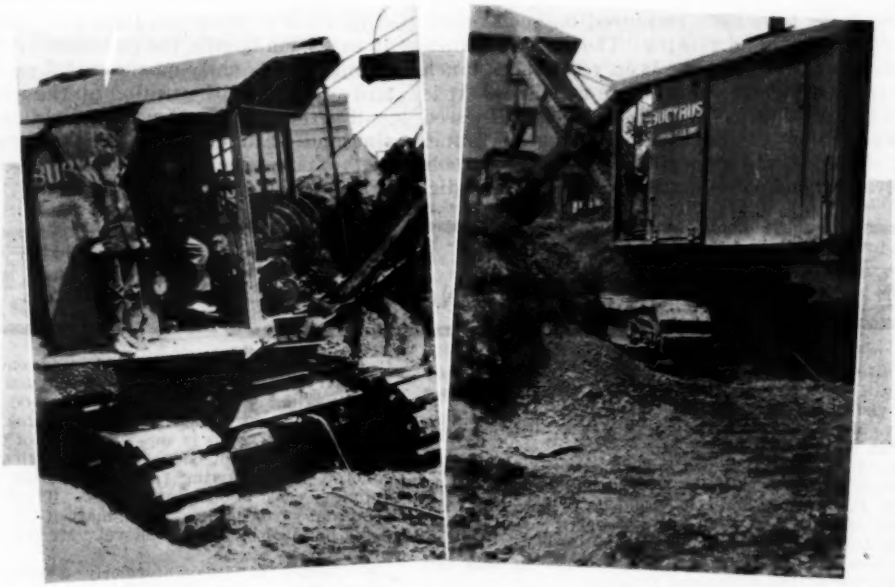
Charles Coops is operating a Thew shovel for the Union Building and Construction Co. of Passaic in their Paterson, New Jersey, quarry.

George Colby is operating a Marion 28 for the Union Building & Construction Co. in their Great Notch, New Jersey, quarry.

Inter-Mountain News

BY H. N. STEINBARGER, DENVER

Excavating and grading for the new shops of the Colorado & Southern and C., B. & Q. Railroads is well under way, under the able management of the Monaghan, Cunningham Construction Company of Denver, one of the livest bunch of contractors in the inter-mountain section. They bid very conservatively and, therefore, during the last few months have not been blest with a great deal of work; however, when they get a contract anyone can rest assured the job will be done right and quick and there will be a fair profit in it. The new joint plant of the C. & S. and Burlington will be very large for this territory, covering 141 acres and the cost will be approximately two million dollars. It will be for repairing locomotives of both railroads, very complete in every detail and the equipment thoroughly modern. It has been needed for several years on account of the rapid growth of Denver and vicinity. To provide for future requirements an additional 135 acres of land have been acquired. At the present time all of the buildings required will be in Denver County, but if future extensions are found necessary such buildings will then be in the adjoining County of Adams.



Grays Harbor County's 14-B Bucyrus shovel making the excavation for a cellar at Elma, Washington. Chester Rowland is at the levers and Theo. Delezenne is the smoke maker.

Here is the original dragline. The upper view was taken at Chochiin, Korea. This is the usual method of moving earth in this country. It will be noted that four men on the ropes do the actual pulling while the fifth man does the guiding. It is a strange and peculiar phenomena that the Korean laborers always wear white and always appear clean, but it is safe to say that they could not dig a Panama Canal. The lower view was taken on the Gezira Canalization Scheme at Wod-El-Nair, on the Blue Nile, Sudan. The principle is the same. They are building small irrigation ditches. Compare with embankment in background thrown up with a Class-14 Bucyrus dragline, one of five Bucyrus draglines, and three English excavators in operation on this project.

In May and June of last year the Governor-General of the Belgian Congo, Mr. Maurice Lippens, and his staff made a detailed inspection of the copper mining district of the Union Miniere du Haut Katanga in the Belgian Congo. The right-hand view shows the Governor-General on the dipper of a 68-C Bucyrus shovel. The other illustrates Mr. Lippens and his staff together with the officers of the mining company standing in front of the same machine. From left to right on the upper row they are as follows: Commander Sohier, Aide de Camp of the Governor-General; Mr. J. Cousin, Director General of the U. M. H. K. in Africa; Mr. J. Olyff, Chief of the Cabinet of the Ministry of the Colonies; Mr. De Cock, Secretary of the Governor-General. Lower row: Mr. Serruys, Vice-Governor-General of the Katanga; Mr. Maurice Lippens, Governor-General; Mr. Sengier, Representative of the Council of the U. M. H. K.; Mr. De Sloovere, Chief of the Economic Affairs; Mr. A. E. Wheeler, Engineering Council of the U. M. H. K.; Mr. Moore, Director-General of Katanga Railroads; Mr. Robiliart, Engineer; Mr. T. Carnahan, Director of the Mines, U. M. H. K. These photographs were taken in the Kambove Mine by Doctor Orenstein of Johannesburg, South Africa. The Kambove Mine is the most important of the four copper mines actually exploited by this Company. This mine is worked by the open-cut system with seven Bucyrus railroad type shovels. One other is at present on order and two Bucyrus revolving shovels are being used in another of their mines. In 1920 the Kambove Mine produced 72,794 tons of rich copper ore, averaging more than 15% copper; 319,938 tons of lower grade ore and 636,000 tons waste.

The above three views show the mines of the Bethlehem Chile Iron Company at Tofo, Chile. Our right-hand top view shows Iron Mountain, with two 100-C Bucyrus shovels on one of the benches. Note the tower line for the Telferage System. The left-hand view shows the sub-station and repair shops with an Osgood shovel in operation. The lower view shows the jaw crusher and the car-unloading tunnel.

The general contract for the entire plant was awarded to the Stearns-Roger Manufacturing Co. of Denver.

Plans for the so-called Moffat Tunnel are progressing rapidly under the supervision of Major L. D. Blauvelt, Chief Engineer for the Tunnel Commission. Engineers have been in the field under the direction of P. A. Kaufman for some time, completing the final survey for the big bore and the railroad approaches to the portals.

Major Blauvelt was Chief Engineer of the Denver & Salt Lake Railroad for which the tunnel is being built, and also was Chief Engineer of the original Tunnel Commission appointed several years ago, at which time the original surveys were made. Unless a change is made one contract will embrace the tunnel, approaches, and all other work in connection. When final decision is reached it will probably include the construction of a pilot tunnel through which the material can be handled, and in this way excavation at several points can be made, as against the other method of digging the bore from each end. The eastern portal will be near Rollinsville, Colorado, and the western portal will be at a point one mile distant from the present Denver & Salt Lake Railroad, about eight miles from Frazier, Colorado, the total length of the tunnel being six miles and 160 feet, and at this writing they have apparently decided on a bore 16 x 24 feet. Full details at a later date will prove interesting, as it is the intention of the State of Colorado to carry water in this same tunnel from the western to the eastern slope for irrigation purposes.

Taggart Bros. and Tebbs of Cowly, Wyoming, are making great headway on their drainage work near Cowley, Wyoming, with the 30-B Bucyrus 1-yd. gasoline dragline, which has now been in service for some time. This little dragline is making great drainage records in northern Wyoming, and the rugged strength built into it, together with its speed and power, will keep on making records in the hands of its present owners who know the game and how to get out the best there is in a machine.

The Utah Construction Company, headquarters Ogden, Utah, now have well under way the big Wind River Canyon job in Wyoming. This work is located partly in Hot Springs and partly in Freemont Counties, and is highway construction for the State Highway Department of Wyoming. The road is thirteen miles long, the entire length through the above Canyon, which at many points is very narrow. The Christensen Construction Company of Salt Lake City have taken part of the work and are using one 70-C and one 40-R Bucyrus shovels, their old standbys as they call them. A considerable portion of the work is hard rock, and especially that which will be encountered in a 300-foot tunnel. There is about 300,000 yards of unclassified material, and it is estimated that 90% will be rock. The entire job will be somewhat difficult to handle on account of the narrow canyon. The material will have to be hauled a considerable distance to open places. It will be impossible to overcast into the river as it would raise the water line to a point that might be dangerous to the Northwestern Railroad which is on the opposite bank of the river. Bidding for this work was very spirited and close, as all of the old-time railroad contractors of this section were after this job. Many of them had been on the railroad construction through this same Wind River Canyon a number of years ago and wanted to put through this new state highway.

George Edward Kennedy, some illustrious name we call it, some handle, the way a Westerner would refer to it, 2030 Clarkson St., Denver, is his address; and also everyone take notice that this is the new address for the Local No. 91 International Brotherhood of Steam Shovel and Dredgemen. They have just moved their local headquarters from 1710 Market St., Denver. Ed Kennedy, as everyone knows him around these parts, has just been elected secretary and treasurer of Local No. 91, succeeding Al Weir who resigned. "Farmer Al" we will call him from now on because he is very much engaged with producing record-breaking crops on a farm near Golden, Colorado. Do not get the idea that Al is quitting the shovel game, because as soon as the crops are in his palms will be itching for the levers that move the earth. No doubt he will be bobbing up serenely as the guiding spirit of some big shovel in this country when fall arrives.

Ed, the old war horse, has not exactly retired from the steam shovel game, but is just biding his time until some big shovel job is pulled off in this section where the big standard type railroad shovels are used. In the meantime, Ed is proprietor of an apartment house, and believe us it is run on the square and the straight and narrow just like he would run a shovel job. We imagine he will be kept pretty busy running both jobs, i. e., the destinies of Local No. 91 and his apartment house. We hope his present line of business will mean that he will continue to make Denver his home, and not hike off to other regions and stay over a period of years as he has done frequently in the past.

Northwestern State News

BY A. R. HANCE, PORTLAND, OREGON

At the letting of the Oregon State Highway Commission at Portland on June 27th and 28th, the following contracts were awarded: Elk River-Sixes Section of Coast Highway in Curry County, 2.66 miles of grading, 82,600 cubic yards common and 14,600 cubic yards rock excavation, John Hakanson, Astoria; Rockaway North Section of Coast Highway, Tillamook County Court; Holdman-Harp's Ranch Section, Pendleton-Cold Springs Highway, Umatilla County, 3 miles grading and broken stone surfacing, 30,700 cubic yards common, 2,800 cubic yards intermediate and 8,600 cubic yards solid rock excavation, Pat Lonergan, Pendleton; Wallowa Hill Section, LaGrande-Joseph Highway, Union and Wallowa Counties, 5.38 miles broken stone surfacing, Sloane Construction Co., Spokane; Unit 2, Ochoco-Mitchell Section, Ochoco Highway, Wheeler County, 12 miles grading and surfacing, 29,000 cubic yards common, 23,000 cubic yards intermediate, and 54,000 cubic yards solid rock excavation, Greenwood & Dann, Portland.

County Engineer Duff, Wenatchee, Washington, reports that the survey for the Blewett Pass road improvement work is nearly completed and bids will soon be advertised for by the county on this job. The county has $45,000 available from the road bond funds, and this will be expended in regrading the road from Peshastin Creek Cross up as far as possible. The rest of the work will be done out of regular road funds.

About four miles of grading are included in the project which will be completed this year. This will extend as far south as the Peshastin mill. There will still be about two miles of grading to be done next year.

Oregon will receive approximately $3,000,000 for road improvement work from the Federal government during the next three years under the terms of the transportation bill just signed by President Harding, according to Herbert Nunn, State Highway Engineer.

The fund allotted to this state will be forthcoming, as follows: 1923, $788,443; 1924, $1,024,785; 1925, $1,182,644.

The appropriation, which is a continuation of the old post road appropriation, will be available for use on main trunk roads of the state highway system, Nunn stated.

On June 9th bids were opened by the Bureau of Roads, Portland, Oregon, and the following contracts were awarded: J. K. Shotwell, Hermiston, Oregon, surfacing Hood River Section of Mount Hood Loop; A. D. Kern, Portland, surfacing Zig Zag Section of Mount Hood Loop; Grant Smith & Co., Portland, 6.3 miles, Suislaw National Forest, Lincoln County, job calls for 11,300 cubic yards rock, and 110,000 cubic yards common excavation; C. T. Jordan, Seattle, Blewett Pass Section of Wenatchee

National Forest, State of Washington, 35,000 cubic yards rock, and 45,000 cubic yards common excavation.

At the letting of the State Highway Commission, Helena, Montana, on June 9th, Rich & Markhus, of Missoula, were awarded contract for road work on Federal Aid Project No. 78, Flint Creek Road, Granite County, 67,918 cubic yards common, 10,392 cubic yards intermediate and 13,171 cubic yards rock excavation.

On June 23rd, the Bureau of Roads opened bids at Portland, and the following contracts were awarded: Siems & Carlson, Spokane, grading and surfacing, Prairie City-Austin Section, Whitman Forest, Grant County, 17.1 miles, 80,000 cubic yards rock, 82,000 cubic yards common excavation; Warren Construction Co., Portland, grading and surfacing, Neskowin-Devils Lake Section, Suislaw Forest, Lincoln and Tillamook Counties, 17 miles, 41,000 cubic yards rock, 190,000 cubic yards common excavation.

Bids were opened on June 29th by the Oregon State Highway Commission, Portland, and the following contracts were awarded: Lostine-Enterprise Section, LaGrande-Joseph Highway, Wallowa County, 7.89 miles grading and surfacing, bids rejected; Eight Mile Creek-Dufur Section, Dallas-California Highway, Wasco County, four bridges, Tobin & Pearce, Amity, Oregon; Island City-Elgin Section, LaGrande-Joseph Highway, Union County, overcrossing at Rhinehard Bridge No. 799, Colonial Building Co., Spokane.

Notes from the Pacific Coast

BY P. H. BIRCKHEAD, SAN FRANCISCO

The Santa Fe and Los Angeles Harbor Railway, R. B. Ball, Chief Engineer of Local Division, 747 Kerckhoff Building, Los Angeles, has applied to the Interstate Commerce Commission for authority to issue $500,000 capital stock to cover cost of construction of a new railway 12 miles in length in Los Angeles County, which will connect the Redondo Branch of the A. T. and S. F. Line with Wilmington.

Contracts have been awarded as follows for the paving of State Highways in Merced County: 1—8.5 miles to be graded and 5.1 miles to be paved with concrete between westerly boundary and San Luis Creek, awarded to Pacific Construction Co., 16 California Street, San Francisco, who bid $125,586.00; 2—12.2 miles between San Luis Creek and Los Banos, to be paved with concrete, awarded to Blanco & Taylor, 37 Main Street, Vallejo, who bid $216,550.00.

Contract awarded to Kaiser Paving Co., First Savings Bank Building, Oakland, who bid $163,934.00 for the paving with 5-in. reinforced concrete base 10.74 miles of state highway in Siskiyou County from Upton to Shasta River.

C. K. Clarke, former engineer of Imperial Irrigation District, and for the past six months at Blythe, has resigned as engineer and general manager of the Palo Verde Mutual Water Company and Levee District. Litigation in Texas has made it necessary for Clarke to be absent from Palo Verde much of the time.

Contract has been awarded to San Francisco Bridge Co., Wells-Fargo Bank Building, San Francisco, who bid $70,360.00 for dredging about 670,000 cubic yards for the Union Pacific Terminal, Los Angeles Harbor.

Contract has been awarded to American Dredging Co., 255 California Street, San Francisco, who bid $.2475 per cubic yard, totaling $9,900, for dredging at Tiburon.

Contract has been awarded to H. H. Lienau, 426 Brookside Street, Redland, at $108,000. for paving with 4-in. concrete streets in Road District, work involving 380,100 square feet paving. Engineers' estimate $109,000.

Contract has been awarded to Grant Smith Co., 707 Balboa Building, San Francisco, who bid $683,050.00 for the construction of the Pulgas Tunnel near Redwood City, Peninsular Division of the Hetch-Hetchy Aqueduct.

Plans are being made by civil engineer, Byron P. Lyons, Susanville, for construction of a sewerage system and disposal plant for the Milwood Sanitary District, covering 300 acres, adjoining the City of Susanville, Lassen County. Bonds will be issued to cover improvements.

The Coast Rock & Gravel Company has double-shifted their 70-C Bucyrus shovel at Fair Oaks; J. J. McGinnis, engineer, "Blackie" Ford, craneman, and Charles Graham, fireman, are doing the night trick; while David Colwes, engineer, J. A. Hudner, craneman, and H. W. Waggoner are still on the day shift.

What is believed to be the world's greatest power and irrigation project is to be the damming of the Colorado River at Boulder Canyon on the border line between Nevada and Arizona. The immensity of the proposition may be seen by comparison since it will cost more than the Panama Canal, and it will have more than ten times the storage capacity of the largest present reservoir, that of the Assuan Dam on the Nile. The Boulder Dam will be 735 feet high and it is expected to develop 6,000,000 acres of arid land, to control the flood from the mighty Colorado River and to develop 5,000,000 horse power of electrical current. Seven states and Mexico will be affected by this largest of governmental undertakings.

A contract has been awarded to the Oakland Paving Company by the State Highway Commission for ten miles of improved roadway from the east boundary of Alameda County to Greenville. The expenditure will total $200,000.00.

Yuba County, California, contemplates the construction of about 100 miles of primary roads within the next two years, the funds for the same to be raised without a resort to a bond issue.

Arizona has withdrawn its opposition to river straightening work designed to protect Palo Verde Valley from further damage by Colorado River flood waters.

Announcement was made some time ago by Governor Stephens of California that a commission representing the two states had worked out a satisfactory solution of the boundary problem, and that the Levee District at Blythe would be permitted to proceed to straighten four bends in the river that have caused serious damage to the levees there this season. The bends to be cut are known as Raab, Hauser, Comer, and Casad. The Colorado broke through at both the Raab and Hauser bends this year and inundated 10,000 acres of land partly under cultivation.

Construction of a line of railway to open up mining properties of great value in the northern portion of Nevada is soon to be put under way. The line will start at Reynard, on the Western Pacific, and will extend in a northwesterly direction to touch the California-Nevada line at the southeast corner of Modoc County, California.

A Union Pacific surveying party has recently completed two surveys to connect Apex, Nevada, with Valley Siding, where the West End Chemical Co. is developing a big borax deposit. It is understood that construction work will start the latter part of November.

Cost estimates are being prepared by Chief Engineer Newell of the Sierra Railway, Oakdale, to determine the feasibility of the construction of a railroad for the Oakdale and South San Joaquin Irrigation Districts to the Melones Reservoir. If constructed the railroad would be 4½ miles in length, 3 miles of heavy grade and 1½ miles of side hill. Grade would be 6%.

Bond issue to vote bonds in amount of $250,000.00 to cover cost of construction of an irrigation system for the San Gabriel County Water District, has been carried. This District embraces about 21,000 acres, obtaining a water supply from four wells and pumping plants. New construction will involve the installation of new pipe lines and constructing a reinforced concrete reservoir. J. A. Bell, San Gabriel, is general manager and chief engineer for the District.

The Lake Hemet Water Company at Hemet, Riverside County, will build an irrigation system to water about 12,000 acres of land in Riverside County. Work will include a concrete dam and a canal 12 miles long and five feet wide on the bottom, together with a number of pipe lines.

The Fall River Irrigation District, in Shasta County, embracing about 13,000 acres, was formed July 1st by a unanimous vote of land owners. 250 sec. ft. will be obtained from Fall River by pumping plants. The work will require canals, details not yet figured, and three pumping plants, two with 30-ft. lifts and one with 18-ft. lift. J. H. Creighton, Glenburn, and Scott McArthur, of McArthur, are trustees. No engineer has as yet been appointed.

Southern States Notes

BY C. N. BALLENTINE AND W. W. WHORLEY

The Louisiana Highway Commission has moved their office from Maison-Blanche Annex, New Orleans, Louisiana, to Raymond Building, Baton Rouge, Louisiana. Mr. J. M. Fourmy is state highway engineer and Mr. W. T. Peterman is chairman of the Louisiana Highway Commission.

W. E. Chambers, steam shovel engineer, is now working for Newell Contracting Company, Birmingham, Alabama. His address is at 612 St. Charles Avenue, Birmingham.

A large drainage system is being considered in Leflore, Carroll and Holmes Counties, Mississippi. Indications are that the work in view will be started as soon as the engineering details are completed.

An extensive project is under consideration by Calcasieu Parish, Louisiana, which will provide for a deep water channel to the Gulf.

Smith Bros., Crockett, Texas, were successful bidders on the gravel road contract in Trinity County, Texas.

Jere Gwin, Birmingham, Alabama, was the successful contractor on the highway work let recently at Tuscumbia.

W. N. Bowdry was the successful contractor on a section of the South Bessemer Road in Jefferson County, Alabama.

The National Portland Cement Company are operating a Marion 60 and an Ohio Shovel in their quarry at Ragland, Alabama. Mr. D. H. Myron Houtz and R. L. York are craning, and Fred Haynes and Marcus Moore firing.

On June 9th, at Nashville, Tennessee, bids were opened on two nice road jobs. Federal Aid Project No. 84 in Bledsoe County was awarded to R. S. Freeman of Knoxville, Tennessee, and Federal Aid Project No. 32 to Boyd Williams of Murfreesboro, Tennessee.

The Allied Construction Company report favorable progress on their extensive sewer contract at Monroe, Louisiana.

Frank Turnbloom is piloting a 70-C shovel at the Mitchell Dam job on the Coosa River near Coopers, Alabama. Bill Clemens is riding the boom and Jack Vardeman is holding down the other end. Kid Barnes is pit foreman, William Dowdell is running the other shift.

Our old friend, P. H. (Pat) O'Brien, president of the O'Brien Construction Company, called recently and told us that a new member in the form of a baby girl had joined the firm recently. Congratulations Pat! Mr. O'Brien has several road jobs in North Carolina and is making headquarters at Franklin, North Carolina.

Mr. E. J. (Ed) O'Brien, a brother of Pat O'Brien, has secured some railroad work near Leeds, Alabama, and has installed a 70-C shovel to handle the excavation.

Mitchell Brothers, Oneonta, Alabama, were low bidders on a paving job between Fairfield and Fairview, suburbs of Birmingham, Alabama. The paving will consist of a 6-inch concrete base covered by a 2½-inch bituminous coating.

A. R. Henson is operating a Class-14 Bucyrus Dragline for List & Gifford Construction Company in a Southern Pacific Railroad gravel pit at Klebung, Texas. Chas. Moss is operating on the night shift and Munro Gipson and Lee Young are keeping the boiler hot. C. W. Edwards has charge of the job.

St. Louis Items

BY A. B. KOENIG

Cox Bros., Indianola, Iowa, have 60,000 yards of state highway work at Lancaster, Missouri, and 200,000 yards at Bloomfield, Iowa, also a good-sized job at Waverly, Iowa, to sublet in quantities to suit outfits.

J. McClavy has moved his outfit on to a new job at New Canton, Illinois. He has enough work there to hold him until the beginning of winter.

J. J. McInerney expects to finish his work at Hartford, Ill., shortly. He is looking around for a job suitable for a 13-team outfit.

Cleary & Hailey, 407 Lyric Building, Cincinnati, Ohio, want to sublet 80,000 yards of state highway excavating, concrete bridge and culvert work on 1¾ mile of highway in Hamilton County, Ohio.

C. R. Cummins and R. Hatfield of the C. R. Cummins Co., Cleveland, Ohio, were with us a day. Hatfield is in charge of their big grading job at Denison, Texas. Says he will finish this work within a couple of months. The Cummins Company have a dragline idle at New Memphis, Illinois, that they would like to place on some work immediately or will sell or lease it. Swetland Building, Cleveland, Ohio, will catch them.

Bricker & Walker, Orient, Ohio, want work for a 10-team and light shovel outfit. Prefer railroad work in Ohio, Indiana and Illinois.

Bates & Rogers Construction Co. of Chicago were low bidders on the Santa Fe work in Kansas.

J. L. Simmons, La Plata, Missouri, is figuring on taking 5 miles of the L. J. Smith bank widening on the M. K. & T. R. R. in Kansas.

S. H. Harris has subbed 5 miles of bank widening on the M. K. & T. R. R. between Parsons and Paola from the L. J. Smith Construction Co.

Willis Dunlevy is moving his outfit on the M. K. & T. R. R. between Parsons and Paola on 5 miles of betterment work that he subbed from the L. J. Smith Construction Co.

L. J. Smith Construction Co., Commerce Building, Kansas City, have some splendid slip and station work to sublet on the M. K. & T. R. R. between St. Louis and Boonville, Missouri. The work consists of bank widening. No work in cuts and no fills over 5 feet high. Will sublet this in quantities to suit outfits.

Morris & Dougherty were low bidders on the Burlington R. R. work at Beardstown, Illinois. This work consists of repairing and raising tracks that were washed out some time ago by high water. About 150,000 yards of dirt to be moved.

Ira J. Printy, Bonnie, Illinois, will finish his road work there in a few days. He is hunting for work in this part of the country.

A. L. Cook, Ottawa, Kansas, was awarded contract for building a reservoir for the M. K. & T. R. R. at St. Joe, Texas. About 50,000 yards of earth, 2000 yards of concrete, 2000 yards of riprap and about 7000 feet of pipe line in this job.

Cox Construction Co. and Yale & Reagan are putting on night crews on the Frisco R. R. near Meramec Highlands, Missouri.

Brooks-Callaway Co., Beauxite, Arkansas, will have 6 large and 5 small shovel outfits, also a brand new tunnel outfit idle shortly. They are anxious to place these on some new work.

The Walsh Construction Co., Muncie, Indiana, have a small team job to sublet at Monee, Illinois.

L. S. Cooper & Sons, Brighton, Illinois, have a 16-team outfit idle and Frank Cooper has 15 teams idle at Hartfort, Illinois. They can move these outfits on work immediately.

Riley & Bailey, International Life Building, St. Louis, Missouri, have about 750,000 yards of wheeler work at Fulton, Missouri, on state highway to sublet.

Russell Condon, another good old-timer, has passed away. Russ died in Omaha on June 25th, as a result of a slight infection on his nose and paid no attention to it until too late, when blood poison set in.

Frank McCaughey, of the J. J. McCaughey Co., reports all of their jobs as getting along nicely. So far they have not experienced any shortage of labor.

Tom Walsh, of the Walsh Construction Co., stopped off for a day here returning from their job on the Frisco R. R. near Paola. While here Tom met quite a few of his old college chums.

Bids for the construction of one hundred miles of hard roads in Illinois received July 6th by the state division of highways are all believed to be under the maximum price of $30,000 a mile, according to announcement made by officials. The bids will be tabulated and contracts probably will be awarded in a short time. The road letting brought contractors from various parts of the country to Springfield. The bids submitted were for roads in various counties of the state. Included was a stretch of .32 of a mile in the city of Carlinville, for the construction of a connecting link in the Springfield-East St. Louis road. The lowest bid of $8,006 was submitted by A. W. Boatman of Carlinville. The Alzina Construction Co. of Springfield bid $10,063. The right-of-way has been secured by residents of Carlinville and it is probable that the contract will be let soon. Bids also were received for the construction of 3.64 miles of pavement in Greene County. The low bid of $71,545 was submitted by Joseph Kesel & Son of Edwardsville. Twelve bids were received for the construction of a new bridge over Salt Creek on the Peoria Road, three miles north of Greenview. W. H. Shons of Freeport submitted the low bid for the construction of Section 1 K, $75,557.77. The Porter-McCully Company of Mackinaw submitted a combination bid of $103,700, of which $88,320.79 was for Section K 1 and $16,481.70 for Section K 2 on Mason and Menard Counties. Several bids were submitted on Section 2 of the bridge, which will be checked up by the department and the lowest bidder determined. The Illinois Steel Bridge Company of Jacksonville submitted a bid of $14,977.77 for the construction of Section K 2. If the bids are found to be within the estimate the contract will be awarded and work will begin immediately. Announcement was made that the present bridge will be moved and used as a temporary structure while the new bridge is under way. The construction of the bridge will not interfere with traffic on the road it was said. The bids submitted for the various highways follow:

Macon County—6.33 miles, The MacMahon Construction Co., Rochester, Indiana, $120,773.10; Veiley Construction Co., St. Joseph, $130,497; Board of Supervisors of Macon County, $139,893.

Green County—3.64 miles, Joseph Kesel & Sons, Edwardsville, $71,545; C. M. Haines, Jerseyville, $72,789; Dawson Bowers Construction Co., St. Louis, $75,258.

Peoria County—3.20 miles, Mack & Rogers, Peoria, $73,681; Capital Construction Co., Des Moines, Iowa, $81,339; L. B. Kuhn, Bloomington, $85,687.

Peoria County—2.85 miles, Mack & Rogers, Peoria, $64,529; Capital Construction Co., Des Moines, $71,168; L. S. Kuhn, Bloomington, $75,229. The lowest combination bid on the two Peoria sections was by Mack & Rogers of Peoria for $138,211.

Hamilton County—4.82 miles, C. G. Moritz, Effingham, $109,499; Mantz & Oren, Effingham, $110,752; J. W. Etchison, Casey, $116,820. Combination bid by Mantz & Oren, $121,500.

Marshall County—4.61 miles, Jaicks Bros., River Forest, $108,217.

Franklin County—4.12 miles, Cole & Fake, Marion, $84,752; Charles E. Hamilton, Carbondale, $91,988; Wabash Construction Co., Vincennes, Indiana, $104,315.

Franklin and Williamson Counties—4.59 miles, Cole & Fake, Marion, $102,133; Charles E. Hamilton, Carbondale, $108,182; Wabash Construction Co., Vincennes, Indiana, $120,795.

Williamson County—1.80 miles, Cole & Fake, Marion, $36,569; Charles E. Hamilton, Carbondale, $41,674; Wabash Construction Co., Vincennes, Indiana, $46,811. Lowest bid on combination for Franklin and Williamson County by Charles E. Hamilton, $241,845.

Will County—10.46 miles, C. J. Moritz, Effingham, $208,264; C. E. Edison Company, Chicago, $221,198; Ponles & Thompson, Joliet, $210,904.

Macoupin County—.30 miles, A. W. Boatman, Carlinville, $8,006; Alzina Construction Co., Springfield, $10,063.

Bond and Fayette Counties—.88 miles, C. J. Moritz, Effingham, $33,769; W. J. Johnson, Belleville, $36,625; Mautz & Oren, Effingham, $38,308; Van Dusen & Baumberger, $47,398.

McLean County—16 miles, combination bids, Cameron, Joyce & Co., Keokuk, Iowa, $368,353; I. D. Lane, Bloomington, $370,515; Alzina Construction Co., Springfield, $374,064; C. E. Carson Company, Chicago, $374,500; Roy L. Williams, Wyatt, Missouri, $380,000; L. S. Kuhn, Bloomington, $405,000. On the separate bids under the combination I. D. Lane of Bloomington was the low bidder, but his combination bid was higher than that of Cameron, Joyce & Co.

Woodford and Tazewell Counties—8.41 miles, Combination bids, Capital Construction Co., Des Moines, Iowa, $225,486. On the separate bids Cameron, Joyce, Smith & Elder of Keokuk, Iowa, was low in Woodford County, $66,796.

The Missouri, Kansas & Texas Railway let a contract for the erection of a new freight depot and warehouse at Waco, Texas, involving an expenditure of $145,000 to the McKenzie Construction Co. of San Antonio, Texas. Work on the new depot, according to F. Ringer, chief engineer of the Katy lines, who signed the contract, will begin as soon as material is available and completion of the structure will require approximately from six to nine months. The freight house will be constructed entirely of reinforced concrete and steel, and will be modernly equipped and will be absolutely fireproof. The freight house to be erected at Waco will be the first of three large, modernly equipped depots to be erected in Texas cities, Ringer said. Bids are now under consideration for another freight depot at Fort Worth and a third at Wichita Falls, Texas. They will involve about the same expenditure as the Waco depot.

Contractors when in want of work or labor for their outfits write or wire Koenig Labor Agency, 612 Walnut Street, St. Louis, Missouri, or 501 Delaware Street, Kansas City, Missouri.

Leo. B. Robbins is finishing his road work near Carbondale, Illinois. He wants another job to place his team outfit on to. Write him at Dowell, Illinois.

Otto Piffel, 345 Calvert Avenue, Webster Groves, Missouri, has an 8-team outfit idle that he would like to place on work in this neighborhood.

Canada

Notes from Ontario

BY C. F. ENGLAND, TORONTO

Curran & Briggs of Orillia, Ontario, have just secured three highway contracts, including grading and surfacing.

James, Proctor & Redfern, Consulting Engineers of Toronto, were selected by the City Sewage Committee to prepare plans for Hamilton's new sewage system and

sewage disposal plant. It is said that the expenditure will amount to $2,500,000.00. Mr. E. R. Gray, City Engineer, represents the Council. The excavation contract will probably be announced shortly.

Work at Toronto, on the improvement of North Yonge Street has at last got the attention it deserves as a long-neglected and much-travelled main artery of this city. The Warren Bituminous Paving Co. of Ontario, Limited, Toronto, started work on their contract to widen Yonge Street last month and are now busy bringing the new work to grade. Mr. Legge, Vice-President, and Mr. Jones are in control of the extensive work.

Lumsden Engineering & Transport Co., Toronto, have started work on the construction of a new road at this point for the Provincial Highway Department. Mr. L. Cummings, President, is on the job from Monday morning to Saturday night.

The Canadian Pacific Railway, Western Division, announce considerable programme of work which includes double tracking near Kenora and grading at Consul, Saskatchewan.

P. Lyall & Sons Construction Co., Limited, of Montreal started work on Sections 3 and 4 of the Welland Ship Canal Contract, which was awarded them last month. Mr. H. M. Scott represents the company in charge of the entire job at the canal, and he is rapidly establishing himself and bringing the job to full activity.

Bates & Rogers Construction Company are very active in their operations in connection with concrete cribs which they are building at Section 1 Welland Ship Canal. The superintendent in charge of this work, Mr. D. E. Mather, has things well organized and is making good progress with the work.

An interesting visitor to Toronto recently was Mr. W. Barnes, representing the Excavator Department of Ruston-Hornsby, Limited, Lincoln, England. Mr. Barnes is just completing a nine months' tour around the world and reports hopefully on conditions, especially in India, Australia, and New Zealand. An interesting incident is that he travelled on the same steamer to Singapore with Mr. Geo. Massey of the Bucyrus Company. He does not say that they exchanged selling prospects, but that they met and parted the very best of friends.

Mr. McCaffrey of Chambers-McCaffrey Construction, Limited, was a visitor at Toronto, having spared a little time from his highway contract at Shelburne, where he is giving the work his personal supervision. He reports good progress, and that the very favorable weather has enabled the highway work to progress rapidly.

Mr. James Pearson, President of Constructing & Paving Co., Limited, of Toronto, told the Board of Control recently that the paving contractors would have to lay off their men if more of the city's paving programme is not released immediately. The $3,000,000.00 appropriated has all been spent, and with the exception of $700,000.00 being expended on North Yonge Street, on which work is still in progress, there is no work available until more contracts are let, and many of the paving men are idle which is not a good state of affairs in the middle of the season. The Board promised to act promptly.

The John E. Russell Company has been awarded contract at Toronto for the new bridge on Gerrard Street, amounting to $750,000.00. Messrs. Townsend and Navin are in charge of the execution of the contract on behalf of the company.

J. P. Porter, Standifer & Porter Brothers, have got Sections 1 and 2 of Welland Ship Canal well opened up for the season, and between themselves and their subcontractors, all working full blast, it presents a busy aspect around there with concrete going in, dirt trains moving, etc.

The Monarch Engineering Company of Buffalo, New York, are making good progress on the concrete tanks which they have under construction for the Canadian Shredded Wheat Company of Niagara Falls. Mr. Hennessey is superintendent in charge of the work.

Montreal and Vicinity

BY J. M. WARD, MONTREAL

The Montreal Harbour Commissioners have awarded contracts for high level wharves to Barnett McQueen Company, Atlas Construction Company and Sterling Construction Company.

The Quebec Provincial Government has over 200 miles highway under contract this season.

O'Connor Brothers of Huntingdon have approximately 48 miles of road work under construction at the present time.

The Nova Scotia Construction Company have about 35 miles of gravel highway for the Quebec Government under construction at the present time.

A recent visitor in Montreal was Mr. E. G. Cameron, General Manager of the St. John Drydock & Shipbuilding Company. Mr. Cameron states they are making good progress on their concrete work on the drydock but will not be able to complete it all this year.

Gorman & Peckham, Halifax, Nova Scotia, are doing considerable paving work for the town of Windsor, Nova Scotia.

Angstrom & Verocchio of Toronto, Ontario, have undertaken to do the excavating on the new reservoir at Montreal, for the E. G. M. Cape Company, Limited.

The Canadian National Railways have recently let contracts for a lot of concrete structures on the Montreal District to Jackson Bros., and on the Toronto District to the Dominion Construction Company and on the Nipigon District to Sherwood Construction Company.

The Provincial Government at Quebec are receiving tenders now for a new $700,000.00 addition to the Parliament Buildings.

J. F. Grenon, Civil Engineer, of Chicoutimi, Quebec, is preparing plans for waterworks sewerage extensions for Jonquieres, Quebec, and Desbiens Mills, Quebec, approximating $75,000.00.

The Town Council of Sydney Mines, Nova Scotia, are going to erect a $70,000.00 school.

Presbyterian & Methodist Missions of Sydney, Nova Scotia, will erect a $50,000.00 building at Whitney Pier.

School Board of Moncton, New Brunswick, will erect $50,000.00 school.

City of Three Rivers is contemplating rebuilding bridge at cost of $400,000.00.

Dominion Iron & Steel, which is one of the subsidiaries of the British Empire Steel Corporation, have resumed work on a large scale. They have blown in a couple of furnaces and are now operating with about 3000 men. This company has also made an arrangement to spend $1,500,000.00 on their Sydney works and have made an arrangement with the Newfoundland Government to expend $3,000,000 in Newfoundland.

It is expected that financial arrangements will be made between the Newfoundland Government and the British Government for the Guarantee Bonds for a $7,000,000.00 development in Newfoundland for the Armstrong Whitworth interests.

Leon Reade of the Reade Construction Company, Minto, New Brunswick, is making good use of his Bucyrus Dragline stripping coal at Minto.

WESTERN NEWS

British Columbia

A paper mill, to cost $100,000, is to be erected on the north arm of the Fraser River within the boundaries of the city of New Westminster, according to an announcement made by the Westminster Paper Co. This is a new organization backed by United States capital, most of the individuals interested being Wisconsin men.

A concentrator of 1,500 tons capacity for the Sullivan zinc mine at Kimberley will be proceeded with at

once, according to information given out by the Consolidated Mining and Smelting Co. of Canada. G. E. Chapman will have charge of the construction and the mill will be designed and built by the company.

A petition to the Government to have the money provided to carry out changes in the 25 miles of road from Princeton to Hope so that it will be suitable for a highway linking the coast and the interior of the province, is being signed by motorists in every community and will be presented to the Lieutenant-Governor for action.

City Council of Vancouver awarded contract to the Western Construction & Paving Co. for asphalt penetration at $1.84 per sq. yd. and for oil penetration at $1.80 per sq. yd. The Columbia Bitulithic Co. was awarded contract for hard-surfacing at $1.46 per sq. yd. and $5 per batch of asphalt mixed.

Approximately $1,500,000 will be spent on highways this year, Hon. W. H. Sutherland, Minister of Public Works, announced. The work includes the Pacific Highway paving in the municipality of Surrey; the Nelson-Ymir Road, $80,000; Cascade-Rossland Road, $230,000; roads in Similkameen District, $80,000; Columbia Valley work, $62,000; Yellow Head Pass project, $68,000, etc.

The contract at New Westminster for construction of concrete retaining wall on Front Street awarded by Provincial Department of Railways to Robertson & Rendell, Vancouver, at $45,000.

The contracts were awarded by Highways Department to E. J. Palmer & Co. for paving two miles of the Yale Road in Langley Municipality. Concrete will be laid at a cost of about $50,000.

Contract for rebuilding Arcade Building at Victoria, which was recently destroyed by fire, has been awarded by David Spencer, Limited, to Luney Bros., at approximately $85,000.

Contract for construction of 2.074 miles of pavement on Yale Road in Chilliwack has been awarded by Highways Department to Columbia Bitulithic, Limited, at $55,000.

Winnipeg and Vicinity

The construction of a new dam and head work at Kimball, Alberta, is proposed to be started shortly. Estimated cost is $200,000.00. This lies in the Alberta Southern Irrigation District, on the completion of which some 160,000 acres of land will be brought within the irrigation area.

Mr. S. B. Wass, Construction Engineer with the Canadian National Railways, has been transferred from Moncton, New Brunswick, and is now in charge of the construction of the new railway yards and buildings at Mount, Ontario, near Fort William.

Excellent growing weather, and the present fine condition of the crops, indicate that Western Canada will have a bumper harvest this year. In fact it is contemplated that the record yield of 1915 will be exceeded.

New construction and maintenance work by the Canadian National and Canadian Pacific Railways are keeping the Steam Shovel Departments of both roads very busy.

The Canadian National Railways have awarded the following contracts: Grading at Lampman, Saskatchewan, to Gibbs Bros.; Grading at Regina, Saskatchewan, to Grossler & Wickstrand; Dam and reservoir at Wiseton, Saskatchewan, to Northern Construction Company; Pipe line at Wiseton, Saskatchewan, to Green & Alsasser; Dam and Reservoir at Rama, Saskatchewan, to C. G. Anderson; Pipe line at Rama to Green & Alsasser; Dam and Reservoir at Pope, Manitoba, to W. A. Dutton; Pipe line at Pope to G. Irwin; Dam and Reservoir at Raymore and Maryfield, Saskatchewan, to W. A. Dutton; Pipe line at Raymore and Maryfield, Saskatchewan, to Green & Alsasser; Dam and Reservoir at Conquest, Saskatchewan, to W. A. Dutton; Dam and Reservoir at Tilney, Saskatchewan, to Riley & Reid; Dam and Reservoir at Lloydminster, Saskatchewan, to Simpson & Shillington.

TRADE NOTES

Kelley Island Selects Officers

The Kelley Island Lime & Transport Co., producers of lime, at their recent directors' meeting, following the annual stockholders' meeting, elected the following officials: John A. Kling, chairman of the board; George R. Johnson of Buffalo, who has been vice-president of the Foundation Co. in charge of its central district for fourteen years, president; F. W. Ohlemacher, who was elected fourth vice-president, has been in charge of the company's vessels and Sandusky department for many years.

Following is a list of officers and the executive committee: Chairman of the board, John A. Kling; president, George R. Johnson; first vice-president, E. W. Oglebay; second vice-president, F. A. Beckwith; third vice-president and general manager, G. J. Whelan; fourth vice-president, F. W. Ohlemacher; secretary and treasurer, C. A. McMorris; assistant general manager, A. B. Mack; assistant secretary and assistant treasurer, F. W. Kuhl; auditor, J. W. Longdon.

Executive committee: John A. Kling, chairman; George R. Johnson, H. M. Hanna, Jr., John Sherwin, John E. Morley, H. G. Dalton.

Other officers are: Sales Manager, Henry Angel; Assistant Sales Manager, F. M. Pinnegar; Purchasing Agent, Victor Price; Traffic Manager, J. F. Potts.

REVIEW OF BOOKS and CATALOGS — **We shall be glad to review, in this column, such books and catalogs as are sent to us.**

JACKS. The Templeton, Kenly & Co., Limited, has recently published a 24-page, 6 x 9 catalog showing various types of Simplex Jacks including Ballast Jacks, Bridge Jacks, Emergency Jacks, Industrial and Car Jacks, and others. The catalog also contains specifications for ordering with diagrams of parts. *Templeton, Kenly & Co., Limited, 1020 South Central Avenue, Chicago, Illinois.*

CHARTER TYPE "R" OIL ENGINE. Catalog No. 22, a 56-page, 8 x 11 booklet, well illustrated. Specifications and details of construction of the Charter Type "R" Oil Engine with examples and illustrations of installations. Excellent reading to anyone interested in gas engines. Catalog will be sent on request. *Charter Gas Engine Co., Sterling, Illinois.*

ELIMINATION OF WASTE IN BLASTING. A 48-page, 6 x 9 booklet by N. S. Greensfelder. A very comprehensive explanation of how waste may be eliminated by the employment of various scientific methods in blasting work. The book contains many interesting diagrams and illustrations and discusses the reduction of waste under the following heads: Planning of Work; Drilling; Choice of Explosives; Use of Larger Sizes; Distribution of Explosives; Advantages of No. 8 Blasting Cups; Use of Stemming; and Preventing Waste in Firing. *Hercules Powder Company, Wilmington, Del.*

SMITH PAVING MIXERS. The T. L. Smith Company has recently published a 5 x 8, 16-page bulletin describing in a very excellent manner with illustrations Smith Paving Mixers. It is very well prepared and explains the various features of the 21-E, 10-E, and 14-E Types including full caterpillar traction, one-man control; Smith high drum design, power discharge, worm boom

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swing, high operating platform, etc. Also operating instructions, table of specifications of the various types etc. *The T. L. Smith Company, Milwaukee, Wisconsin.*

ACME TRUCKS. A new 8½ x 11, 40-page catalog, describing and illustrating various models of Acme Trucks. The catalog sets forth the fifteen features of the Acme Stake Body and contains descriptions of the standard cab, express body, moving van, coal body, motor busses, tractors, and the Acme Cotta Transmission. *Acme Motor Truck Company, Cadillac, Michigan.*

PROFITS ON A ROAD JOB ARE REGULATED BY THE TIME SAVED. An 8 x 11, 8-page pamphlet, recently published, describing in a comprehensive manner the time and money-saving attributes of Blaw-Knox Central Proportioning Plants; Steel Storage Bins; Adjustable Measuring Batchers; Road Forms; Truck Turntables; Subgrade Testers; Tarpaulin Carriers; Steel Forms for Roads, Streets and Sidewalks; and All Steel Portable Handy Houses. *Blaw-Knox Company, Pittsburgh, Pennsylvania.*

BOSS MIXERS. An 8½ x 11, 16-page catalog, describing with illustrations in a very comprehensive manner the various types of Boss Concrete Machinery, including Heavy Duty Mixers, High Drum and Draining Mixers, Building Mixers, Half Bag Mixers, Bridge Builders' Mixer, Pavers' Attachments, Hoisting Attachments, and other types manufactured by the *American Cement Machinery Company, Keokuk, Iowa.*

QUARRY CAR PRACTICE. The Easton Car & Construction Company has published Part Three of their series of 7 x 9, 32-page booklets. It is an excellently prepared photographic record, and the result of much research done by their engineers, to be used for the publication of a complete and authentic photographic record of quarry operation and equipment, in all parts of the country. The booklet contains many interesting photographs showing various crushing and screening plants, various types of cars, skips and tipples, dumping methods, and other photographs, which would undoubtedly be of value to those interested in quarry operation and equipment. *Easton Car & Construction Company, Easton, Pennsylvania.*

Russel Condon

The Excavating Engineer wishes to express its extreme sorrow in behalf of the many friends of Russel Condon who died at his home in Omaha, Nebraska, June 18th. His death was the result of a slight infection on his nose which later developed into blood poison. "Russ" as he was most commonly known among his friends, was one of the best-known old timers in contracting circles.

Through the formation of a Railway Department as an active branch of the Wisconsin State Highway Commission, definite recognition has been given to the necessity of careful planning in the relocation of highways and expert consideration of the question of eliminating grade crossings. In taking this step Wisconsin has again demonstrated its fitness in assuming a leading position as a good roads state. For years the Wisconsin system of concrete roads has been attracting the attention of highway officials from all parts of the country, while the splendid system of highway marking, originated by State Highway Engineer A. R. Hirst, is justly famous.

M. W. Torkelson, former bridge engineer for the Wisconsin commission, has been placed at the head of the new Railway Department. His work will be chiefly connected with relocation of highways and elimination of grade crossings. The Wisconsin authorities are firmly convinced that many dangerous crossings can be eliminated by proper steps before expensive improvements are carried out, and that by careful relocation many of these crossings can be abolished altogether. Highway officials, as shown by the Wisconsin innovation, are realizing more and more that the duties of the state departments include not only the construction of good, durable roads, but precautions for the safety of the motoring public in the way of separated grades and properly located routes.

Federal Aid

The Department of Agriculture is considering a tentative draft of rules and regulations for the administration of the Federal Highway Act, approved last November, under which $75,000,000 is appropriated for the construction of federal-aid roads, but will not promulgate them until it has conferred with representatives of state highway departments. Fifty million dollars of the $75,000,000 appropriation became available January 1. The remaining $25,000,000 was made immediately available upon approval of the act, November 9, last. In formulating the fundamental rules which will govern the states and the federal government in administering the law, the Department of Agriculture is seeking the counsel of the state highway departments. Each state highway department has been requested to submit as soon as possible to the Department a tentative map showing routes proposed for primary and secondary systems. In examining and passing upon these recommendations special consideration will be given to social and economic questions involved, such as service to population, established trend of traffic, existing industries, natural resources, etc. In considering plans for individual projects special attention will be devoted to grade crossings, gradients, curvature, bridges, general drainage conditions, location of material supplies, etc., but in the selection of the system the broader social and economic principles will govern.

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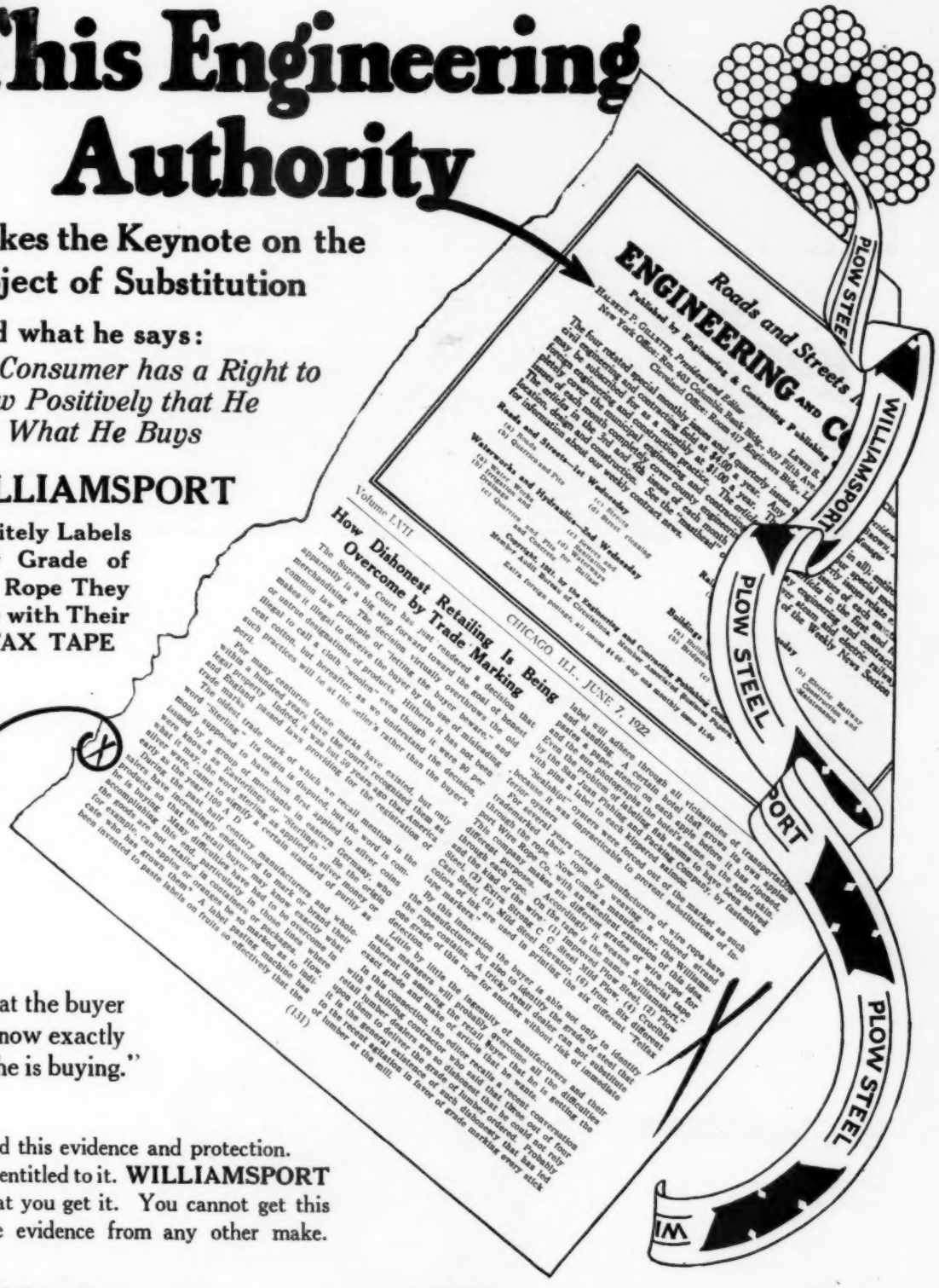

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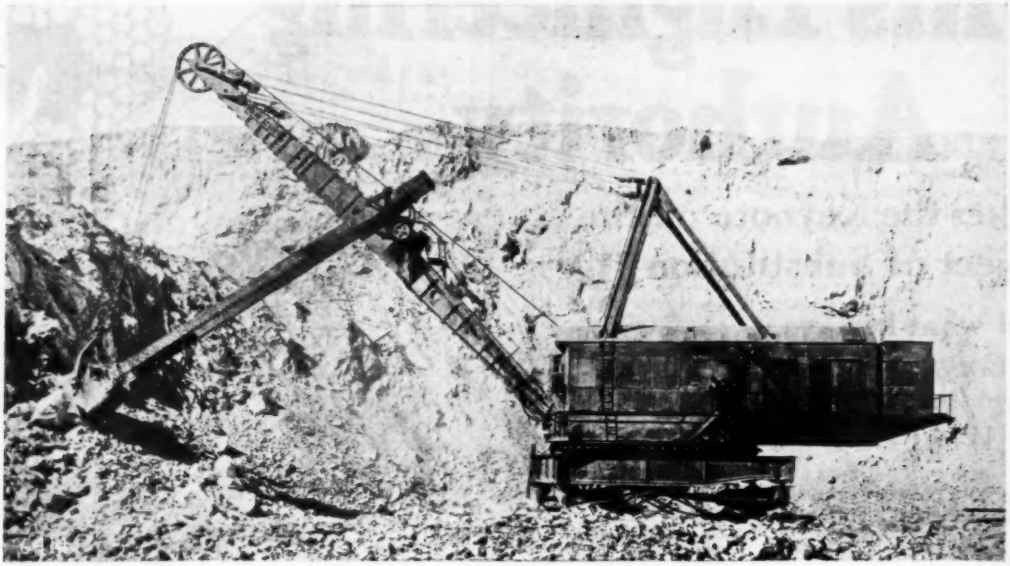

One of the Bucyrus 225-B Electric Shovels in the Ore

225-B Bucyrus cutting down to the inter-level. The 103-C shovel in the background is on the bench from which the 225-B started. Note that the front trucks are under blocking whereas the rails under the rear trucks rest simply on the ties. This shovel cut down 47 feet in 300 feet on this cut. 16" x 16" timbers are bolted on to the truck base for protection against blasts.

Another view of the 225-B on the same cut. Note the fleet of churn drills required to keep pace with the shovel.

Electric Shovel Operation, Chile Exploration Co.